

WHAT IS CLAIMED IS :

1. An x-ray mask blank having at least an x-ray membrane on a substrate,

wherein said x-ray membrane has a surface condition satisfying the following expression (1):

$$(Ra_{\max} - Ra_{\min}) / (Ra_{\max} + Ra_{\min}) \leq 0.15 \quad (1)$$

where Ra_{\max} denotes a maximum value of Ra of a surface roughness (Ra : center-line average roughness) on a plurality of points within a predetermined area on said x-ray membrane, and

Ra_{\min} denotes a minimum value of Ra of the surface roughness (Ra : center-line average roughness) on a plurality of points within a predetermined area on said x-ray membrane.

2. The x-ray mask blank according to claim 1, wherein an average of the surface roughness (Ra : center-line average roughness) on a plurality of points within a predetermined area on said x-ray membrane is 1.0 nm or less.

3. The x-ray mask blank according to claim 2, wherein the surface of said x-ray membrane is a generally uniformly polished surface.

^{sup} 4. The x-ray mask blank according to any one of claim 1, wherein said x-ray membrane comprises a silicon carbide film.

